



LITTLE GOOSE DAM TANK INSPECTION REPORT

Submitted to:

US Army Corps of Engineers
Little Goose Dam
Dayton, Washington 99328
October 30, 2013

Submitted by:



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Quality-One

Inspection Company, LLC

Client: US Army Corps of Engineers
1001 Little Goose Dam Road
Dayton, Washinton 99328

Project: LITTLE GOOSE DAM; SP001TANK INSPECTION

Date: October 11, 2013

Report No.: 13079



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To: Stephanie Thomas
Lower Monumental Dam
1001 Little Goose Dam Road
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Date: 10/11/13

PROJECT: LITTLE GOOSE DAM; SP001 TANK INSPECTION

The U.S. Army Corps of Engineers requested that Environment International Government Ltd. (EIGov) inspect oil storage tanks in accordance with Steel Tank Institute SP001, "Standard for the Inspection of Aboveground Storage Tanks". EIGov subcontracted Quality-One Inspection Company, LLC to complete the storage tank inspection.

The inspection included five (5) tanks, four (4) tanks located in the oil storage room and one (1) tank located outside at elevation 555.5 feet.

The following table summarizes the tanks that were inspected. The tanks located in the oil storage room are Category 1 Tanks in accordance with SP001. The head gate hydraulic oil tank is a Category 3 Tank.

Tank Location	Tank Description	Capacity (gallons)	Tank Wall	Tank Category
Oil Storage Room (El. 494')	Tank No. 1, Clean lube oil	10,000	Single	1
	Tank No. 2, Dirty lube oil	10,000	Single	1
	Tank No. 3, Clean transformer oil	20,000	Single	1
	Tank No. 4, Dirty transformer oil	20,000	Single	1
642'	Head Gate Hydraulic Oil Tank	1,200	Single	3

Ultrasonic thickness testing (UTT) was used to determine the wall thickness of the tank bodies and heads. This data for each tank is included in the individual tank results section of this report.

The inspection was completed on October 1, 2013.

INSPECTION SUMMARY

Oil Storage Room (El. 400')

General Observations

1. The four vertical oil storage tanks are not fastened or secured to the floor. Each tank rests on four (4) tank supports that bear directly on the floor. These tanks should be secured.
2. The dial level gages on each tank are leaking oil. These gages were not currently calibrated. These gages should be calibrated to verify operation and accuracy of the gages.

Tank No. 1, Clean Lube Oil, 10,000-Gallon Capacity

1. This tank has some threaded fittings that are leaking. These leaks should be fixed at a convenient time in the near future.
2. There was no severe corrosion found with UTT. The overall condition of the tank is good.

Tank No. 2, Dirty Lube Oil, 10,000-Gallon Capacity

1. This tank has some threaded fittings that are leaking. These leaks should be fixed at a convenient time in the near future.
2. There was no severe corrosion found with UTT. The overall condition of the tank is good.

Tank No. 3, Clean Transformer Oil, 20,000-Gallon Capacity

1. This tank has some threaded fittings that are leaking. These leaks should be fixed at a convenient time in the near future.
2. There was no severe corrosion found with UTT. The overall condition of the tank is good.

Tank No. 4, Dirty Transformer Oil, 20,000-Gallon Capacity

1. The tank has corrosion occurring at one of the tank support base angles. There is standing water in these locations. The water should be diverted away from the tank supports, the corrosion removed and the affected area re-coated.
2. This tank has some threaded fittings that are leaking. These leaks should be fixed at a convenient time in the near future.
3. There was no severe corrosion found with UTT. The overall condition of the tank is good.

Head Gate Hydraulic Oil Tank, 1,200-Gallon Capacity (El 642')

1. This tank is not grounded. In Steel Tank Institute R912 "Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids" it states in 1.2 "For tank installations without cathodic corrosion protection, the tank should be grounded in accordance with applicable electrical and fire code standards."
2. There is not an emergency relief vent. An emergency relief vent capable of venting 125,000 cubic feet per hour should be installed. It may be possible to use the manhole as an emergency relief vent by installing longer bolts.
3. There is not an overflow for this tank. Overflow piping and reservoir should be installed in order to account for an overflow condition. This is a category 3 storage tank that has no secondary containment.
4. There is not an NFPA placard that identifies the contents of the tank. An appropriate placard with the identification of the tank contents should be attached to the tank.
5. There is a cover that is placed over this tank when in service. An NFPA placard and identification of the oil should be placed on this cover to identify the tank and the contents.
6. This tank was leak tested in accordance to Steel Tank Institute R12 (STI) INSTALLATION INSTRUCTIONS FOR SHOP FABRICATED STATIONARY ABOVEGROUND STORAGE TANKS FOR FLAMMABLE, COMBUSTIBLE LIQUIDS". There were no leaks detected.

7. There was no severe corrosion found with UTT. The overall condition of the tank is good.

INSPECTION SCHEDULE

All oil storage tanks covered by SP001 require periodic aboveground storage tank (AST) inspections by the owners inspector. Monthly inspections that conform to an established tank inspection procedure that provide a written record will satisfy this requirement.

Category 1 tanks, 5,001 to 30,000 gallons, require a formal external inspection every 20 years.

All of the tanks in the oil storage room will require a formal external inspection in the year 2033.

The head gate hydraulic oil tank will require a formal external inspection and leak test in 5 years, or the year 2018.

Details of our inspection are found in the following captions and figures.

If you have any questions or need further assistance, please contact me.



Mark Habel
API 653 Certificate Number 32217
STI SP001 Certificate Number AC 25110

Oil Storage Room (El 494')

This photograph shows the one of the tank supports. Each tank has four of these supports. These supports are bearing on the oil storage room floor and are not fastened down. These tanks should be secured.



This photograph shows oil leaking through the gasket on a level indicating gage on one of the tanks. The dial level gages on each tank are leaking oil. These gages were not currently calibrated. These gages should be calibrated to verify operation and accuracy of the gages.



Tank No. 1, Clean Lube Oil, 10,000-Gallon Capacity

This is a 10,000-gallon capacity, single-walled oil storage tank.

The drawings specify the tank shell to be 0.25-inch and the head to be 0.32-inch thick. There was no severe corrosion found with UTT. The overall condition of the tank is good.



These photographs show some leaking threaded fittings on the bottom of the tank. These leaks should be fixed at a convenient time in the near future.



Elevation 494', Oil Storage Room Tank 1
UTT Readings

Shell

Location	North	East	South	West
Top head to shell	-	-	-	0.259
15'	-	-	-	0.256
14'	-	-	-	0.260
13'	-	-	-	0.263
12'	-	-	-	0.263
11'	-	-	-	0.262
10'	0.266	0.266	0.258	0.260
9'	0.265	0.263	0.257	0.259
8'	0.262	0.261	0.255	0.258
7'	0.240	0.246	0.246	0.245
6'	0.241	0.246	0.247	0.246
5'	0.242	0.248	0.248	0.247
4'	0.242	0.248	0.248	0.248
3'	0.243	0.247	0.248	0.248
2'	0.243	0.248	0.248	0.247
1'	0.242	0.247	0.247	0.246
Bottom head to shell	0.242	0.247	0.246	0.244

Bottom Head

Location	0° (N)	45° (NE)	90° (E)	135° (SE)	180° (S)	215° (SW)	270° (W)	315° (NW)
0' (head to shell)	0.321	0.312	0.313	0.306	0.313	0.311	0.308	0.305
1'	0.307	0.303	0.297	0.296	0.298	0.304	0.298	0.300
2'	0.301	0.298	0.296	0.294	0.296	0.298	0.295	0.295
3'	0.302	0.300	0.298	0.297	0.299	0.300	0.303	0.304
4'	0.306	0.306	0.304	0.302	0.305	0.307	0.306	0.307
Drain	0.245	0.246	0.246	0.243	0.245	0.242	0.246	0.247

All readings are in inches.

All UTT readings were taken with a Panametrics 38DL plus, utilizing the echo-to-echo feature to cancel the paint.

Tank No. 2, Dirty Lube Oil, 10,000-Gallon Capacity

This is a 10,000-gallon capacity, single-walled oil storage tank.

The drawings specify the tank shell to be 0.25-inch and the head to be 0.32-inch thick. There was no severe corrosion found with UTT. The overall condition of the tank is good.



These photographs show some leaking threaded fittings on bottom of the tank. These leaks should be fixed at a convenient time in the near future.



Elevation 494', Oil Storage Room Tank 2
UTT Readings

Shell

Location	North	East	South	West
Top head to shell	-	-	-	-
15'	-	-	-	-
14'	-	-	-	-
13'	-	-	-	-
12'	-	-	-	-
11'	-	-	-	-
10'	-	-	-	-
9'	-	-	0.259	0.260
8'	-	-	0.257	0.258
7'	0.241	-	0.243	0.241
6'	0.241	-	0.243	0.243
5'	0.242	-	0.219	0.242
4'	0.241	-	0.243	0.243
3'	0.241	0.243	0.242	0.242
2'	0.240	0.242	0.243	0.241
1'	0.239	0.240	0.242	0.240
Bottom head to shell	0.237	0.240	0.241	0.240

Bottom Head

Location	0° (N)	45° (NE)	90° (E)	135° (SE)	180° (S)	215° (SW)	270° (W)	315° (NW)
0' (head to shell)	0.308	0.306	0.310	0.308	0.312	0.305	0.313	0.306
1'	0.295	0.295	0.297	0.297	0.300	0.298	0.301	0.298
2'	0.293	0.292	0.293	0.293	0.299	0.295	0.299	0.296
3'	0.296	0.298	0.296	0.296	0.300	0.300	0.299	0.298
4'	0.305	0.304	0.304	0.304	0.304	0.304	0.305	0.304
Drain	0.252	0.254	0.253	0.254	0.253	0.521	0.253	0.248

All readings are in inches.

All UTT readings were taken with a Panametrics 38DL plus, utilizing the echo-to-echo feature to cancel the paint.

Tank No. 3, Clean Transformer Oil, 20,000-Gallon Capacity

This is a 20,000-gallon capacity, single-walled oil storage tank.

The drawings specify the tank shell to be 0.25-inch and the head to be 0.50-inch thick. There was no severe corrosion found with UTT. The overall condition of the tank is good.



These photographs show some leaking threaded fittings on the tank. These leaks should be fixed at a convenient time in the near future.



Elevation 494', Oil Storage Room Tank 3
UTT Readings

Shell

Location	North	East	South	West
Top head to shell	-	-	-	-
15'	-	-	-	-
14'	-	-	-	-
13'	-	-	-	-
12'	-	-	-	-
11'	-	-	-	-
10'	-	-	-	-
9'	0.254	0.256	-	-
8'	0.246	0.256	-	-
7'	0.241	0.244	-	-
6'	0.241	0.245	-	-
5'	0.241	0.244	-	-
4'	0.243	0.245	0.244	0.243
3'	0.243	0.244	0.243	0.243
2'	0.243	0.244	0.243	0.243
1'	0.242	0.243	0.244	0.242
Bottom head to shell	0.239	0.242	0.242	0.241

Bottom Head

Location	0° (N)	45° (NE)	90° (E)	135° (SE)	180° (S)	215° (SW)	270° (W)	315° (NW)
0' (head to shell)	0.488	0.495	0.503	0.492	0.494	0.497	0.483	0.491
1'	0.489	0.494	0.499	0.489	0.487	0.486	0.491	0.485
2'	0.490	0.489	0.501	0.493	0.490	0.493	0.493	0.492
3'	0.495	0.493	0.502	0.501	0.493	0.497	0.497	0.495
4'	0.494	0.500	0.499	0.503	0.499	0.500	0.500	0.500
5'	0.499	0.502	0.500	0.505	0.502	0.499	0.500	0.503
6'	0.501	0.505	0.504	0.503	0.504	0.502	0.503	0.503
Drain	0.502	0.503	0.505	0.507	0.500	0.488	0.502	0.504

All readings are in inches.

All UTT readings were taken with a Panametrics 38DL plus, utilizing the echo-to-echo feature to cancel the paint.

Tank No. 4, Dirty Transformer Oil, 20,000-Gallon Capacity

This is a 20,000-gallon capacity, single-walled oil storage tank.

The drawings specify the tank shell to be 0.25-inch and the head to be 0.50-inch thick. There was no severe corrosion found with UTT. The overall condition of the tank is good.



These photographs show the corrosion occurring at the tank support base angles. There is standing water in this location. The water should be diverted away from the tank support, the corrosion removed and the affected area re-coated.



These photographs show some leaking threaded fittings on bottom of the tank. These leaks should be fixed at a convenient time in the near future.



Elevation 494', Oil Storage Room Tank 4
UTT Readings

Shell

Location	North	East	South	West
Top head to shell	-	-	-	-
15'	-	-	-	-
14'	-	-	-	-
13'	-	-	-	-
12'	-	-	-	-
11'	-	-	-	-
10'	-	-	-	-
9'	0.249	-	-	0.251
8'	0.248	-	-	0.258
7'	0.260	-	-	0.260
6'	0.262	-	-	0.261
5'	0.262	-	-	0.263
4'	0.263	0.263	0.257	0.264
3'	0.264	0.262	0.256	0.264
2'	0.264	0.262	0.255	0.263
1'	0.262	0.260	0.255	0.263
Bottom head to shell	0.260	0.258	0.253	0.262

Bottom Head

Location	0° (N)	45° (NE)	90° (E)	135° (SE)	180° (S)	215° (SW)	270° (W)	315° (NW)
0' (head to shell)	0.507	0.506	0.505	0.501	0.520	0.500	0.518	0.502
1'	0.500	0.497	0.494	0.492	0.495	0.492	0.494	0.495
2'	0.493	0.492	0.491	0.493	0.491	0.491	0.495	0.493
3'	0.497	0.497	0.490	0.494	0.494	0.490	0.497	0.496
4'	0.503	0.503	0.496	0.500	0.498	0.495	0.498	0.502
5'	0.507	0.506	0.502	0.501	0.502	0.502	0.508	0.507
6'	0.508	0.508	0.504	0.477	0.504	0.511	0.510	0.511
Drain	0.514	0.512	0.512	0.496	0.514	0.513	0.515	0.521

All readings are in inches.

All UTT readings were taken with a Panametrics 38DL plus, utilizing the echo-to-echo feature to cancel the paint.

Head Gate Hydraulic Oil Tank, 1,200-Gallon Capacity (El 642')

This is a 1,200-gallon, single-walled storage tank without any secondary containment.

This tank is not grounded. In Steel Tank Institute R912 "Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids" it states in 1.2 "For tank installations without cathodic corrosion protection, the tank should be grounded in accordance with applicable electrical and fire code standards."

There is not an NFPA placard that identifies the contents of the tank. An appropriate placard with the identification of the tank contents should be attached to the tank.

There was no severe corrosion found with UTT. The overall condition of the tank is good.



There is not an emergency relief vent. An emergency relief vent capable of venting 125,000 cubic feet per hour should be installed. It may be possible to use the manhole as an emergency relief vent by installing longer bolts.

This tank should be vented to atmosphere.

There is not an overflow for this tank. Overflow piping and reservoir should be installed in order to account for an overflow condition. This is a category 3 storage tank that has no secondary containment.

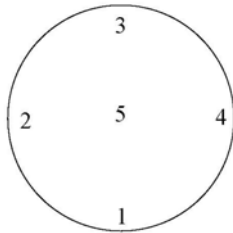
The leak test of this tank was performed by pressurizing the tank to 1.5 psi with nitrogen gas. The pressure was maintained as leak solution was applied to all the welds on the tank exterior. No leaks were detected.



These photographs show some leaking threaded fittings on each end of the tank. These leaks should be fixed at a convenient time in the near future.



Elevation 642', Head Gate Hydraulic Oil Tank
UTT Readings

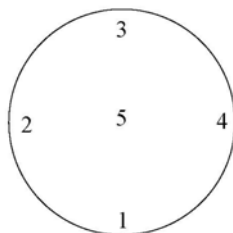


North Head

1	2	3	4	5
0.291	0.259	0.260	0.264	0.262

Shell

Location	0°	90°	180°	270°
North head to shell	0.176	0.181	0.180	0.177
1'	0.184	0.188	0.186	0.184
2'	0.192	0.195	0.191	0.189
3'	0.194	0.198	0.191	0.192
4'	0.193	0.200	0.194	0.192
5'	0.190	0.197	0.195	0.190
6'	0.183	0.191	0.189	0.186
7'	0.179	0.185	0.183	0.182
South head to shell	0.173	0.176	0.173	0.175



South Head

1	2	3	4	5
0.296	0.261	0.255	0.258	0.266

All readings are in inches.

All UTT readings were taken with a Panametrics 38DL plus, utilizing the echo-to-echo feature to cancel the paint.

UTT TANK SHELL THICKNESS CRITERIA

Category 3 ASTs - If the shell thickness has been reduced to less than 75% of the original shell thickness, then the AST shall be taken out of service and repaired or replaced.

Category 2 ASTs – The AST shall be repaired or replaced if more than 3 square inches of any one square foot of the tank shell (i.e. approximately 2%) is found to be less than 75% of the original shell thickness or if the remaining shell thickness of an area is less than 50% of the original shell thickness at any point.

Category 1 ASTs - The AST shall be repaired or replaced if more than 3 square inches of any one square foot of the tank shell (i.e. approximately 2%) is found to be less than 50% of the original shell thickness or if the remaining shell thickness of an area is less than 25% of the original shell thickness at any point.

UTT EQUIPMENT

Olympus 38DL Plus, Serial Number 110159203
Resolution 0.001-inch

5 MHz dual transducer, D791, Serial Number 868920

Calibration Block: 5 step block, 0.100 to 0.500-inch, Serial number 1136